09/688785

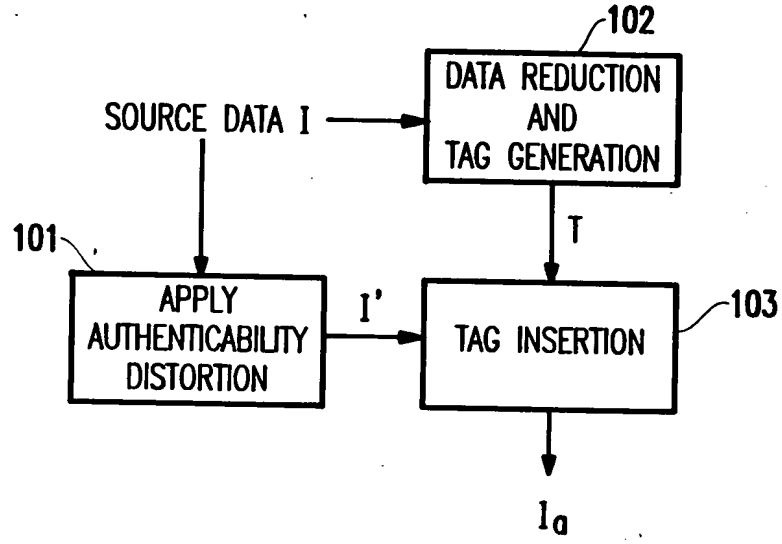


FIG.1A

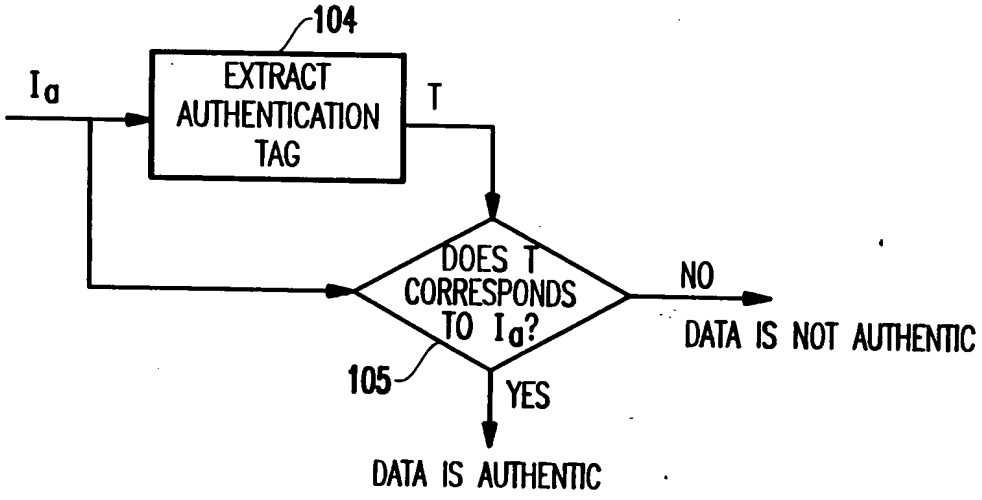


FIG.1B

09/688785

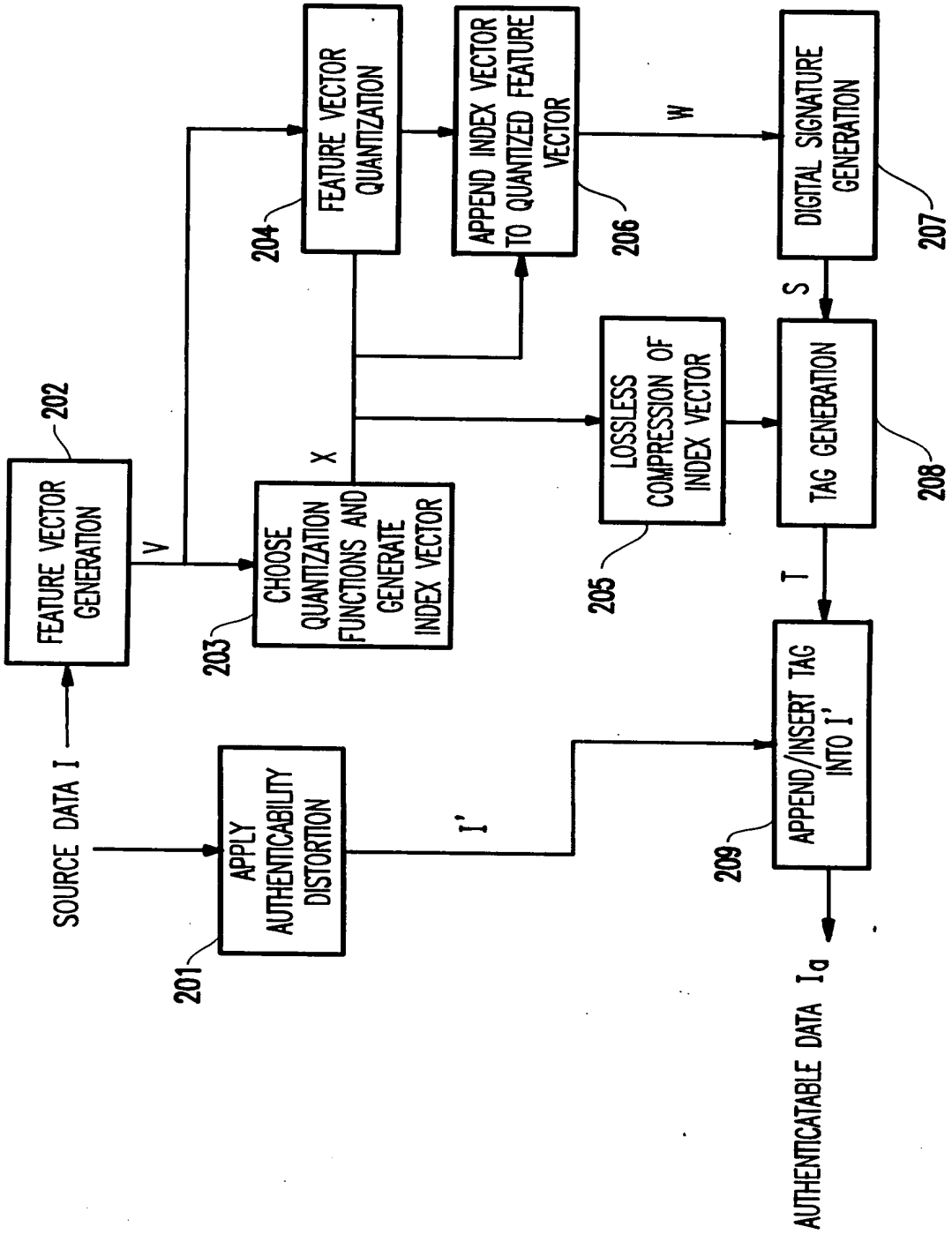


FIG.2A

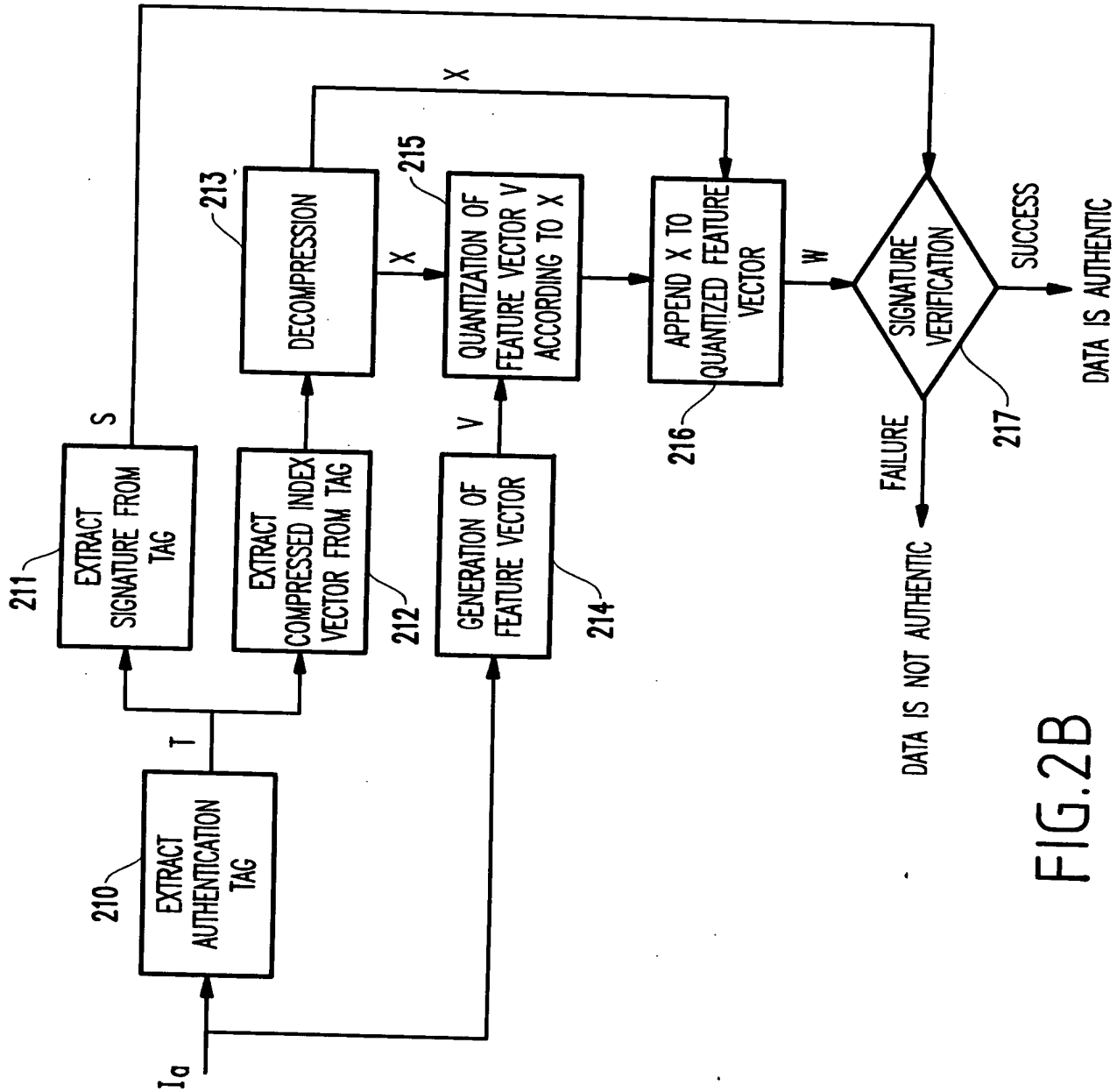

Ia
210
EXTRACT AUTHENTICATION TAG
T
211
EXTRACT SIGNATURE FROM TAG
S
212
EXTRACT COMPRESSED INDEX VECTOR FROM TAG
213
DECOMPRESSION
X
214
GENERATION OF FEATURE VECTOR
V
215
QUANTIZATION OF FEATURE VECTOR V ACCORDING TO X
X
216
APPEND X TO QUANTIZED FEATURE VECTOR
W
217
SIGNATURE VERIFICATION
SUCCESS
DATA IS AUTHENTIC
FAILURE
DATA IS NOT AUTHENTIC

FIG.2B

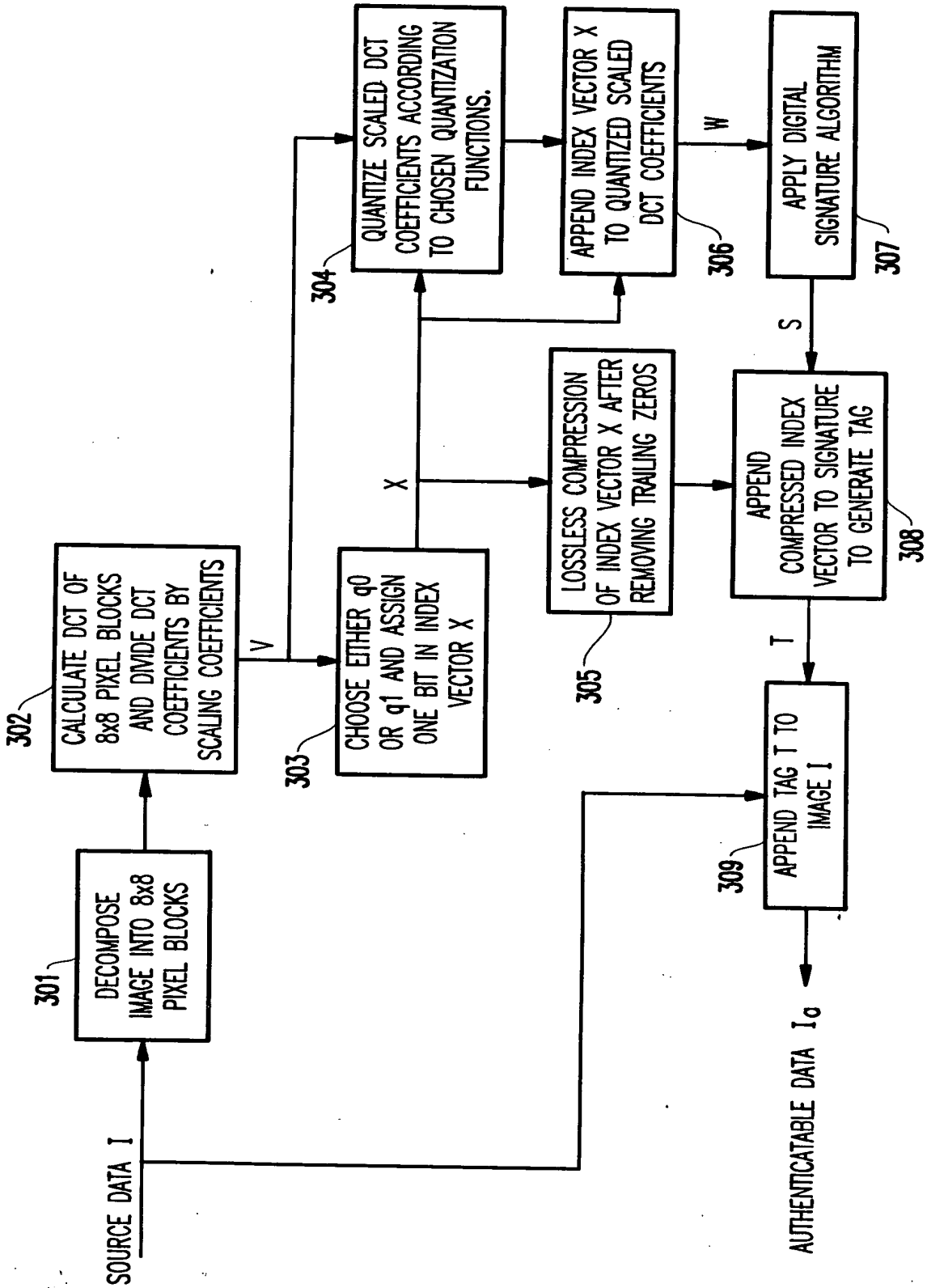

SOURCE DATA I
301
DECOMPOSE IMAGE INTO 8x8 PIXEL BLOCKS
302
CALCULATE DCT OF 8x8 PIXEL BLOCKS AND DIVIDE DCT COEFFICIENTS BY SCALING COEFFICIENTS
V
303
CHOOSE EITHER q0 OR q1 AND ASSIGN ONE BIT IN INDEX VECTOR X
X
304
QUANTIZE SCALED DCT COEFFICIENTS ACCORDING TO CHOSEN QUANTIZATION FUNCTIONS.
305
LOSSLESS COMPRESSION OF INDEX VECTOR X AFTER REMOVING TRAILING ZEROS
306
APPEND INDEX VECTOR X TO QUANTIZED SCALED DCT COEFFICIENTS
W
307
APPLY DIGITAL SIGNATURE ALGORITHM
S
308
APPEND COMPRESSED INDEX VECTOR TO SIGNATURE TO GENERATE TAG
T
309
APPEND TAG T TO IMAGE I
AUTHENTICATABLE DATA Io

FIG.3A

09/688785

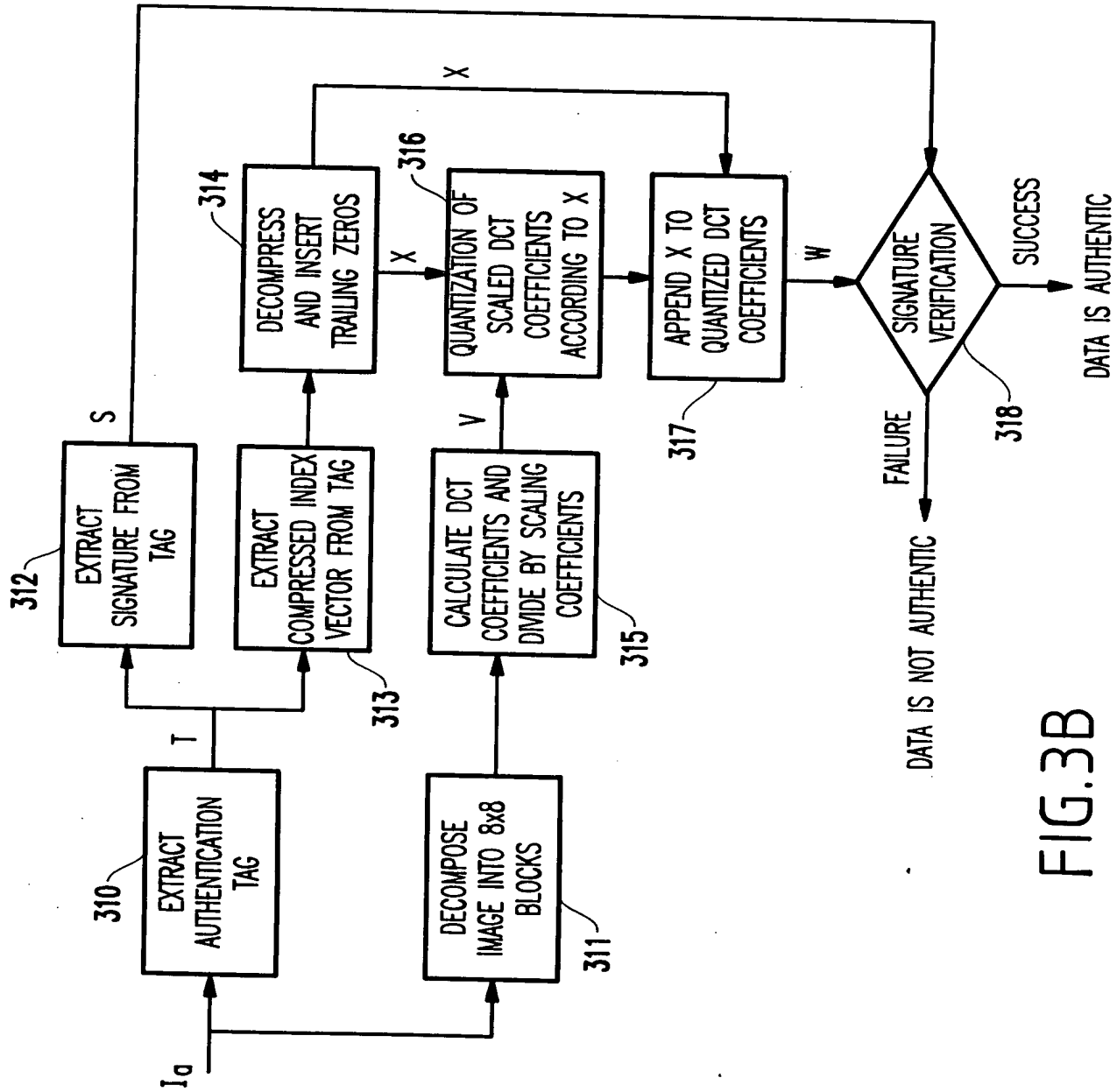


FIG.3B

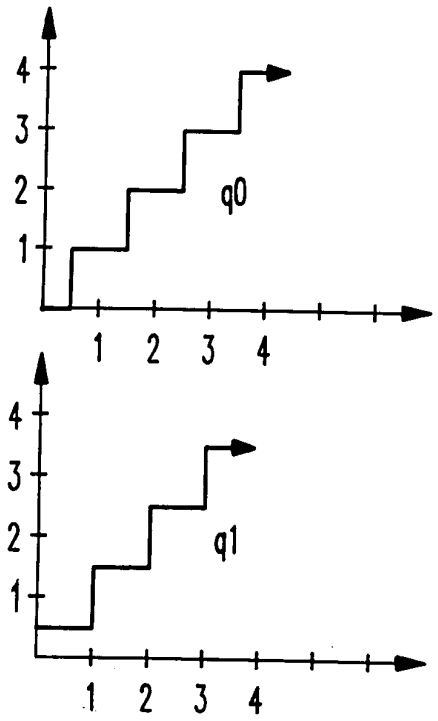
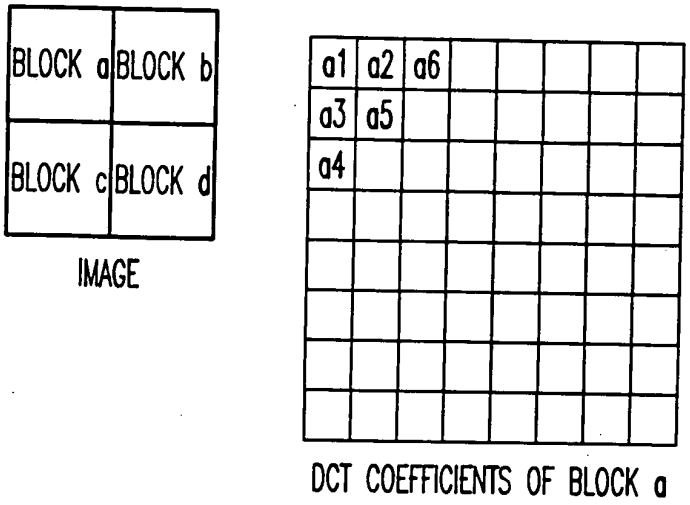


FIG.4



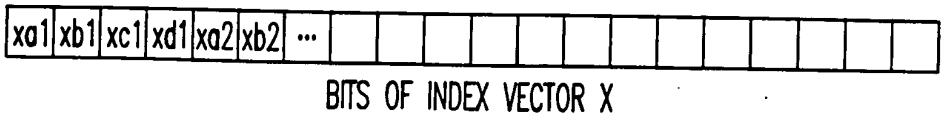
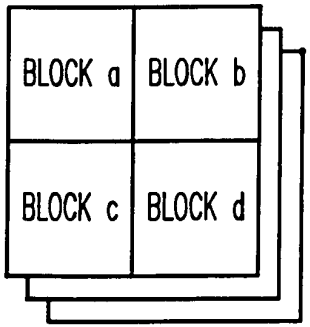


FIG.5A

aj IS THE j-TH DCT COEFFICIENT OF BLOCK a.
xaj IS THE BIT CORRESPONDING TO THE QUANTIZATION FUNCTION CHOSEN FOR DCT COEFFICIENT aj.



COLOR IMAGE

a11	a12	a16					
a13	a15						
a14							

DCT COEFFICIENTS OF BLOCK a OF COLOR PLANE 1

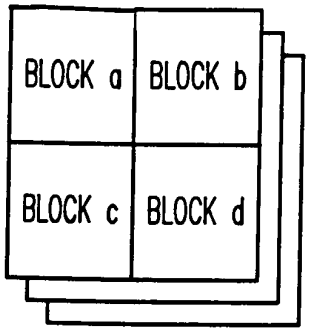
xa11	xa12	···	xa18	xb11	xb12	···	xb18	···	xd18	xa21	···	xd38	xa19	···					

BITS OF INDEX VECTOR X

aij IS THE j-TH DCT COEFFICIENT OF BLOCK a OF COLOR PLANE i.

xaij IS THE BIT CORRESPONDING TO THE QUANTIZATION FUNCTION CHOSEN FOR DCT COEFFICIENT aij.

FIG.5B



COLOR IMAGE

a11	a12	a16					
a13	a15						
a14							

DCT COEFFICIENTS OF BLOCK a OF COLOR PLANE 1

xa11	xb11	xc11	xd11	xa21	xb21	xc21	xd21	xa31	xb31	xc31	xd31	xa12	...						

BITS OF INDEX VECTOR X

aij IS THE j-TH DCT COEFFICIENT OF BLOCK a OF COLOR PLANE i.

xaij IS THE BIT CORRESPONDING TO THE QUANTIZATION FUNCTION CHOSEN FOR DCT COEFFICIENT aij.

FIG.5C

09/688785

09/688985

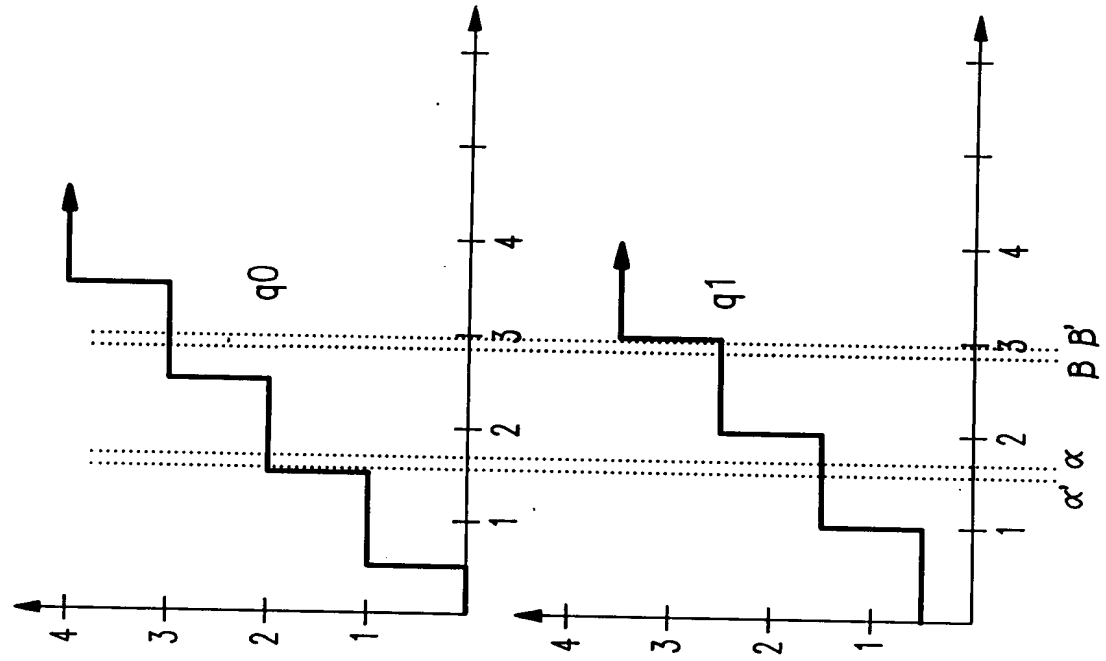


FIG.7

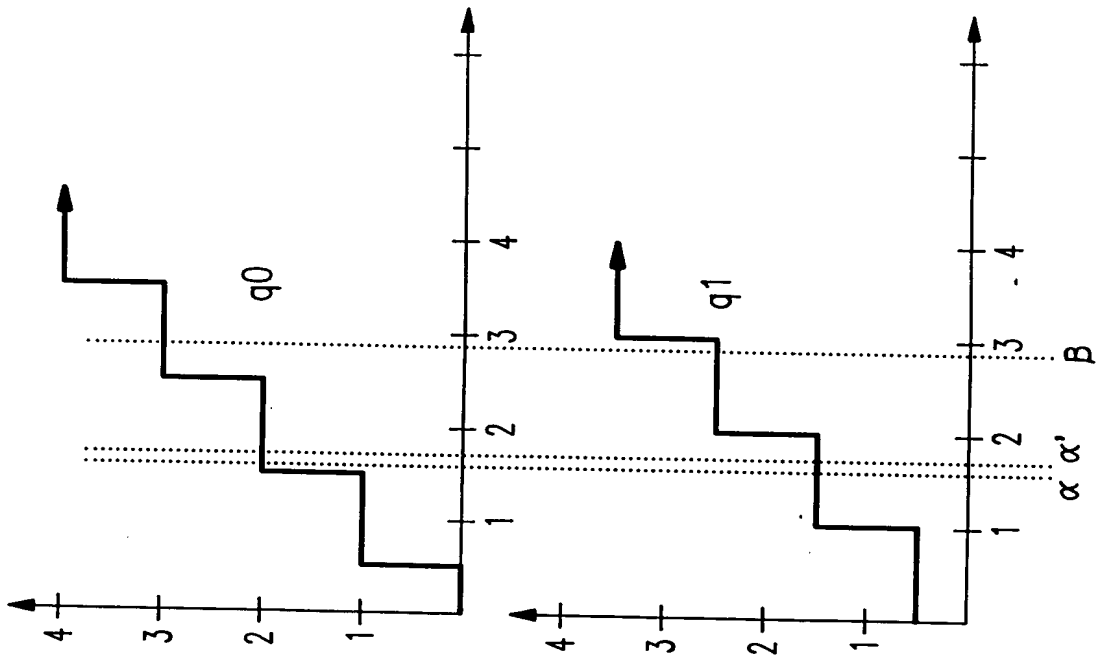


FIG.6

09/688785

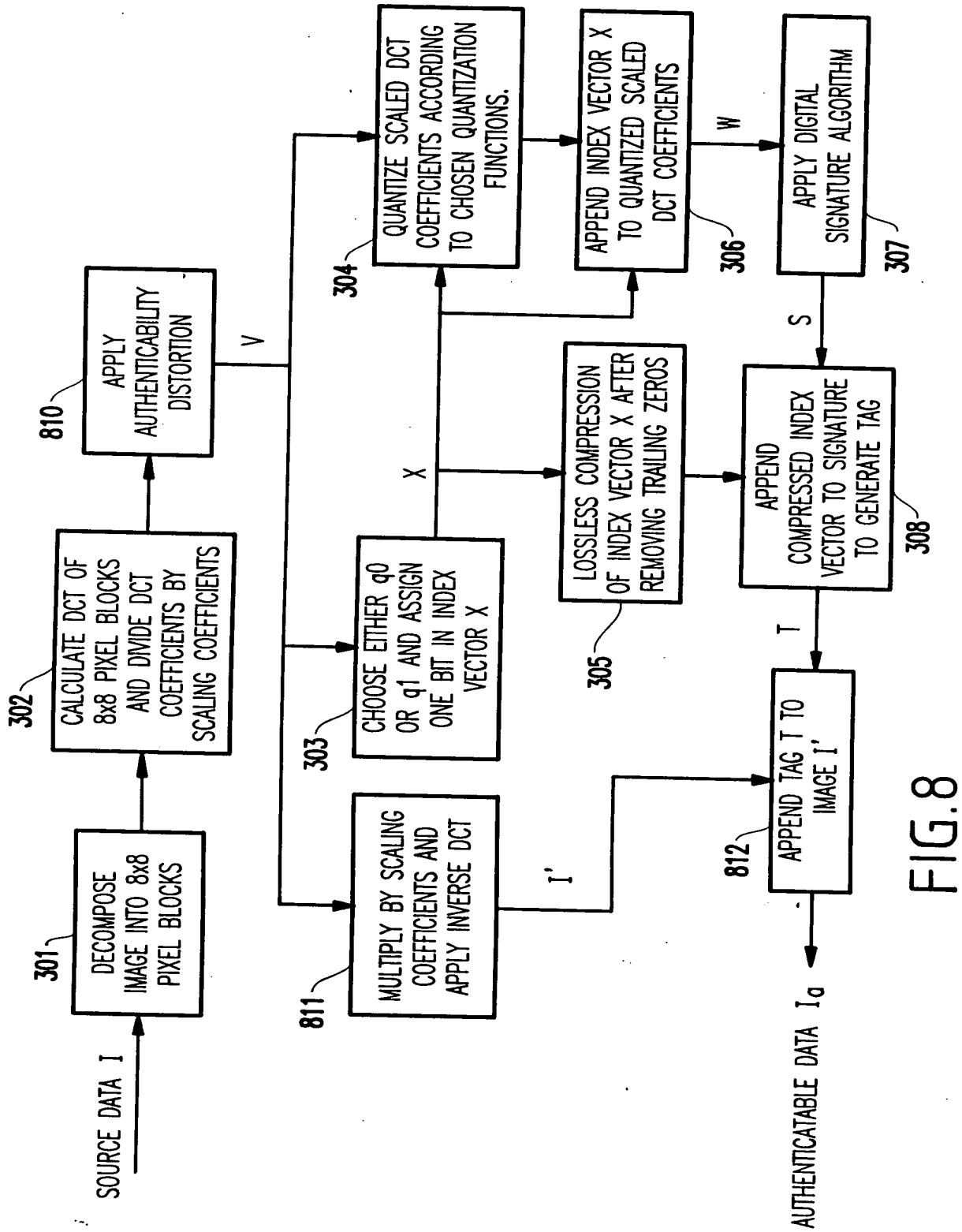


FIG.8

09/688785

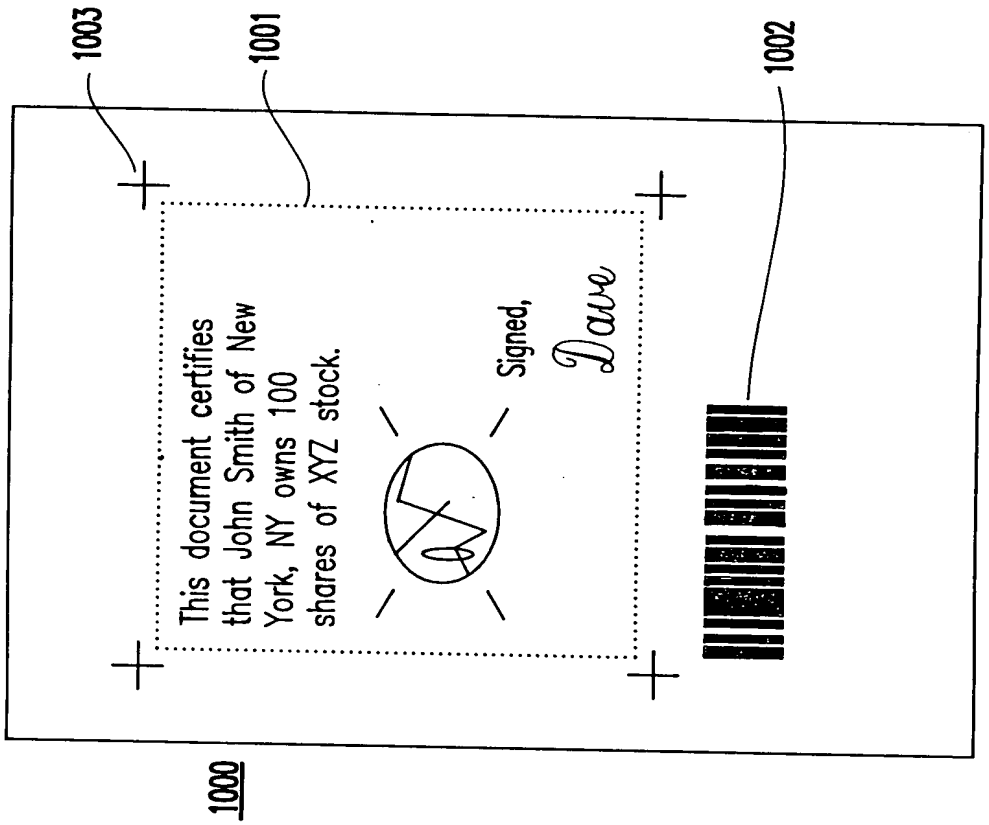


FIG.10

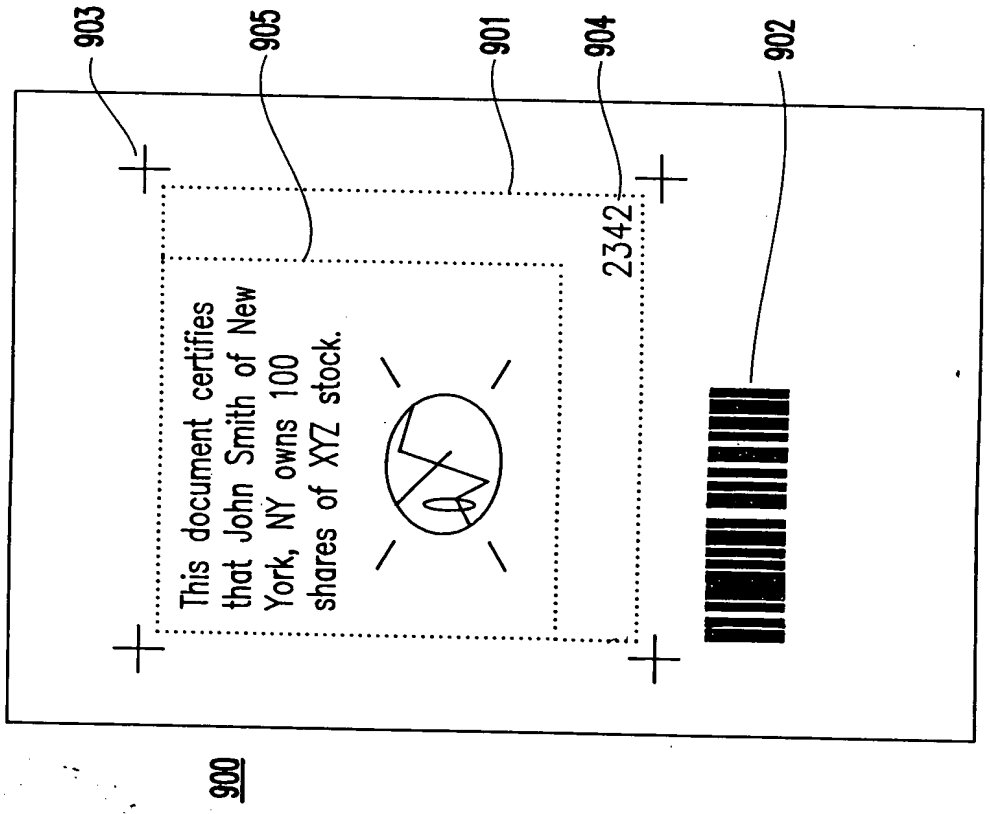


FIG.9

09/688785

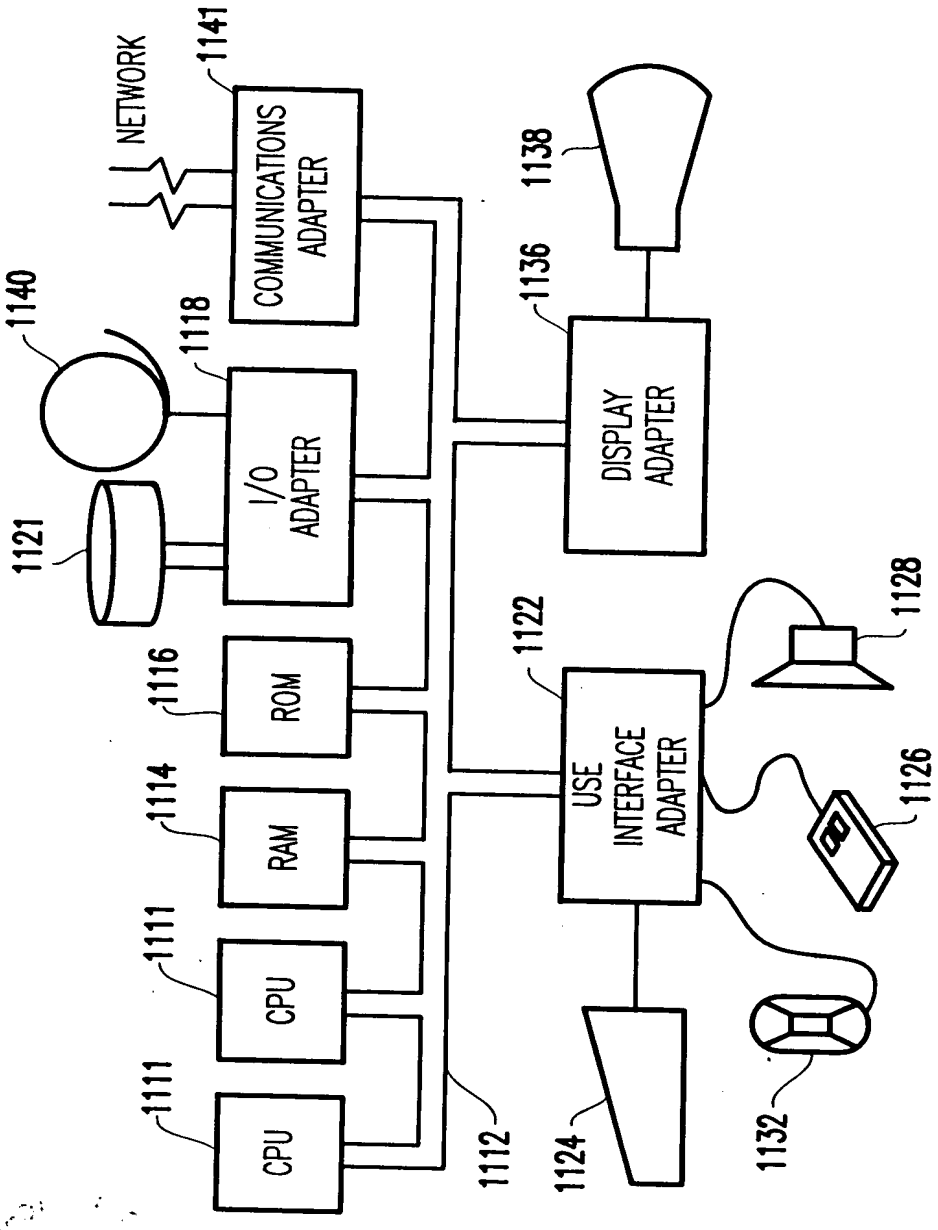


FIG.11

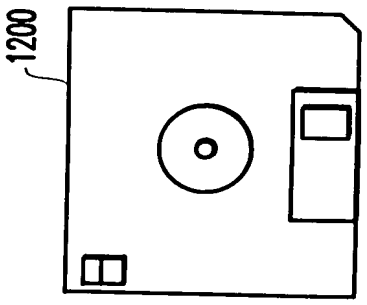


FIG.12